PLAN 1000™

Print Server
Installation and Operation Manual

NESTAR

NESTAR SYSTEMS, INCORPORATED

PLAN SERIES™

PLAN 1000 PRINT SERVER

INSTALLATION AND OPERATION MANUAL

DISCLAIMER OF WARRANTIES

How to Use This Manual

This manual describes how to install PLAN 1000 Print Server hardware and how to install, customize, and maintain the software that runs on it. The manual assumes general knowledge of the network and its use in the various user and server station environments.

Chapter 1 of this manual is a brief introduction to the PLAN 1000 Print Server describing how it is integrated into the network.

Chapter 2 describes how to install the print server hardware.

Chapter 3 describes how to install the print server software.

Chapter 4 describes the volumes that must be modified or created to customize the print server. The contents of the shipped volumes:

    /MAIN/SYSTEM/PRINTERS/CONFIG/$D0
    /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE

are listed in this chapter.

Chapter 5 describes the parameters in the configuration volume /MAIN/SYSTEM/PRINTERS/CONFIG/<name>.

Chapter 6 describes the volume /MAIN/SYSTEM/NAMES.

Chapter 7 describes specific tasks you may want to perform to customize your print server.

Chapter 8 describes how to use the print server once it is installed and configured.

Appendix A provides a technical description of print server operations.

Appendix B describes print server diagnostic error messages.

Appendix C contains protocol information.

The material in this document applies to Version 1.0 of the print server software used with a PLAN 1000 Print Server.

We welcome criticism and suggestions. Forms for reporting program errors and documentation errors or inadequacies are provided at the back of this manual.

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Chapter 1

The PLAN 1000 Print Server

1.0 Introduction

The PLAN 1000 Print Server is a station running special
software that processes print requests on the network.

When a user issues a print request, the virtual print driver in the
user's station sends the file to a volume on the user's default file
server called /MAIN/SYSTEM/QUEUE/NEW. The print server
checks this volume and puts any requests it finds into a master
queue. When the request reaches the top of the queue, it is
printed on the printer specified in the print request.

Other Nestar PLAN Series print servers include the Apple // and
IBM PC.

Appendix A contains a technical description of print server
operations.

1.1 Multiple Printers and Multiple Print Servers

Each PLAN 1000 Print Server can run up to three printers: two
with parallel interfaces and one with a serial interface. Up to
three jobs can be printed simultaneously by each print server.

More than one print server can be attached to the network.

Users can designate which printer and print server are to pro-
cess each job.

1.2 Multiple Setups

Different types of jobs can be processed on the same printer.
Combinations of fonts, ribbon colors, paper sizes, page lengths,
etc., can be defined to process labels, checks, and other types

of documents. These different combinations are called **print setups.**

Fifteen different setups can be defined for each print server, and setups can be changed at any time.

The print server checks the requirements for a particular job against the current printer configuration. If the print server finds that the printer is set up to perform the job according to print request specifications, the job will print as soon as it reaches the top of the queue.

Sometimes the job cannot be processed with the current printer setup (for example, if a printer is set up to print checks, it cannot print documents because the parameters and paper are not appropriate). A user request will remain in the queue until the printer and print server are reconfigured to match the request.

1.3 Multiple File Servers

The print server can be configured to check up to 32 file servers on the network for print requests. Therefore, users can print files from any file server on the network (if they are defined in the configuration volume).

The print server software can be configured to recognize the names of printers, print setups, and file servers. After configuration, the system manager can inform users of the names of file servers, print servers, printers, and setups.

Chapter 2

Installing the Print Server Hardware

To install PLAN 1000 Print Server hardware, perform the following tasks (see Figure 2-1).

(1) Unpack the print server.

(2) Set the print server station address using the hexadecimal switch on the back panel. The PLAN 1000 Print Server is shipped as address $D0 (hex).

A binary/decimal/hexadecimal conversion table can be found in Appendix A of the *Network Installation Reference Manual.*

(3) Using the BNC connector on the back panel, cable the print server to an active HUB (you cannot use a passive HUB) as shown in Figure 2-1.

(4) Attach the printer(s). If only one parallel printer is being used, make sure you attach it to parallel port 1 (not 2).

(5) Plug in the power cord.

(6) Turn the power switch on.

(7) Adjust the LCD contrast if necessary.

Figure 2-1

PLAN 1000 Print Server Hardware Installation

POWER SWITCH

RESET BUTTON

ADDRESS SWITCH

NETWORK CONNECTION

DISPLAY CONTRAST

PRINTER CONNECTIONS
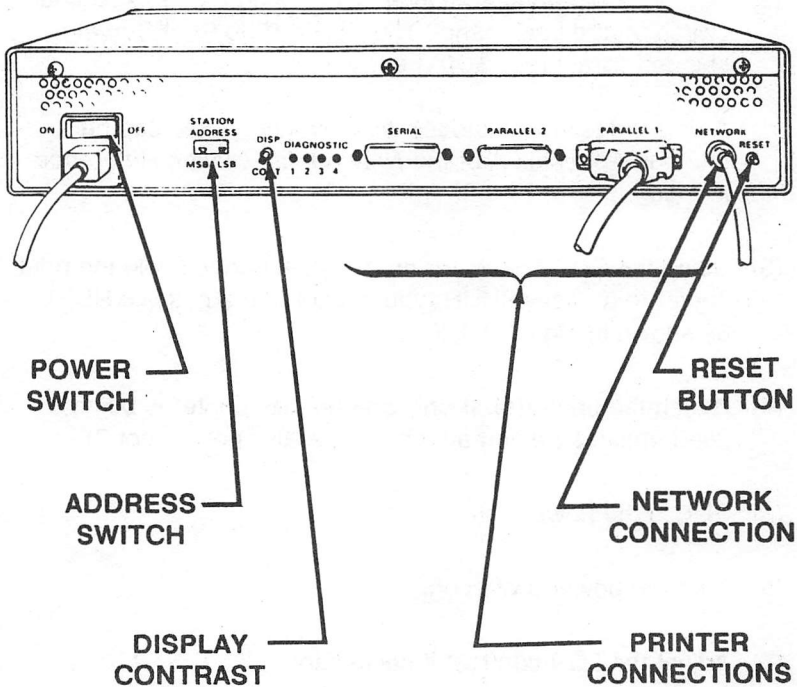
Chapter 3

Installing the Print Server Software

3.0 Introduction

This chapter describes how to install the PLAN 1000 Print Server software on your hard disk.

Read the following instructions thoroughly <u>before</u> beginning the installation. The instructions must be followed exactly. Do not continue to the next step if you run into a problem; resolve the problem first.

Note: Volumes on the installation tape have pathnames that begin with /MAIN. If the name of the shared hard disk from which your file server boots is other than /MAIN, you will need to RENAME the volumes as you restore them from the tape to your disk. (File servers are shipped with the primary disk having the name /MAIN. Therefore, unless you have renamed the root directory of the disk, the name will be the same.) The following instructions will, where applicable, explain what to do if you need to RENAME the volumes.

3.1 Determining Whether Installation Is Necessary

First determine if you do in fact need to install the print server software. From the file server console, issue the command

    LIST /MAIN/SYSTEM/PRINTERS/VERSION.

If the following message is displayed

    102,FILE NOT FOUND

the print server software is not on your disk, and you need to install it from tape.

If the print server software already exists on your system, the software version will be displayed, for example:

1.1,T=T

Here 1.1 is the version number.

Note the version number and compare it with the label on your PLAN 1000 Print Server software tape. If the version number on the tape label is less than or equal to the version number displayed, there is no need to install the software; the latest version of the software already exists on your disk. However, if the version number on the tape label is greater than the version number displayed, you need to replace the existing software.

3.2 Installing the Software for the First Time

If the system displayed 102,FILE NOT FOUND console, you must perform the following tasks to install the software from tape to hard disk:

(1) Type **QUIT** at the file server console.

(2) Select option B, Partial Tape Dump/Restore, from the utilities menu and make a complete backup of the contents of your disk.

Note: It is imperative that you use the verify option with the Incremental Archive backup. Unless you verify the tape, you cannot be certain that you have a good backup of your system. The amount of time it takes for a full backup depends on the number of volumes to be saved and their sizes. (More information about the partial tape dump/restore program, Incremental Archive, can be found in the /f2File Server Installation and Operation Manual/f1. If you have any questions, contact your Nestar technical support representative).

(3) Label the tape with the date and "Full Backup."

(4) Restore /MAIN from tape to disk.

3.3 Upgrading PLAN 1000 Software

The following section explains the procedures for upgrading
existing PLAN 1000 Print Server Software. If you have deter-
mined (from the procedure described in Section 3.1) that an out-
dated version of PLAN 1000 software exists on your disk, you
should consult the following subsections for the proper installa-
tion upgrade procedures:

FS Version 2.2 (or less)	Section 3.3.1
early releases of FS Version 2.3	Section 3.3.2
later releases of FS Version 2.3	Section 3.3.3
FS Version 2.4 (all releases)	Section 3.3.3

(The later releases of File Server Versions 2.3 include SR5.1,
SR5.2 and SR5.3.)

3.3.1 Upgrading Software from File Server Version 2.2
   (or Lower)

Use the Boot Utility Tape you received with your system to
make this upgrade.

If you have customized some partial tape dump canned opera-
tions, you will need to recreate them after installing the file
server portion of the upgrade since the file containing the
current canned operations will be destroyed during the upgrade.
If you do not have a written copy of the contents of each of your
canned operations, make one now—before starting the upgrade.
To do this, quit the file server, and select option K, Add or
Modify Tape Dump Instruction, from the File Server Utility Menu.
files. Use the D(isplay) function to list the contents of each
canned operation (see the *File Server Installation and Operation
Manual* for more information on this utility).

SOFTWARE INSTALLATION

The steps required to upgrade the software are as follows:

Step 1. RENAMING /MAIN/SYSTEM/FSCMD VOLUME

While in the file server program, rename your FSCMD volume if you presently have one.

To see whether you have this volume, issue the command

   LIST /MAIN/SYSTEM/FSCMD

If the volume is present, issue the command

   RENAME /MAIN/SYSTEM/FSCMD,OLDFSCMD

If the volume is not present, proceed to Step 2.

After you have finished with the rest of these installation instructions, you may wish to merge your previous FSCMD volume with the new one provided with this upgrade. If so, use the TCOPY program to copy

   /MAIN/SYSTEM/OLDFSCMD

to a DOS file; then edit it, adding the lines:

   debug 0
   display recon off

This procedure merges the new FSCMD file with your old file. TCOPY this new file back to

   /MAIN/SYSTEM/FSCMD

specifying **Y** in response to the "Replace Destination?"' query in order to overwrite the copy of /MAIN/SYSTEM/FSCMD that was shipped to you.

Step 2. RENAMING THE /MAIN/SYSTEM/FILESERVER
VOLUME

While in the file server program, rename your FILESERVER
volume if you presently have one.

To see whether you have this volume, issue the command

LIST /MAIN/SYSTEM/FILESERVER

If the volume is present, issue the command

RENAME /MAIN/SYSTEM/FILESERVER,OLDFILESERVER

If the volume is not present, proceed to Step 3.

Step 3. RESTORING THE NEW SOFTWARE

Insert the Boot/Utility Tape you received with your system
release into the tape drive. Reboot the file server. Press
<Esc> to get to the boot menu, then enter <T> to boot from
the Boot Utility Tape rather than from the disk. When the File
Server Utility Menu comes up, select option B, Partial Tape
Dump/Restore.

Select the R)estore option.

In response to the prompt

Which files do you want to confirm restore for:

type **N** <**Return**>.

In response to the prompt

Overwrite any existing files?

type **Y** <**Return**>.

Note that this will overwrite only those volumes on disk that have the same name as the to-be-restored volumes from the tape.

In response to the prompt

Rename files on disk?

type **N** <**Return**> if your disk is named /MAIN. Then, in response to

Pathname 1:

type **/MAIN** <**Return**>.

If your disk has a name other than /MAIN, type **Y** <**Return**>.

The systm will prompt for the volume name you wish to use. Respond with the name of the hard disk. For example, if the name of the hard disk is /ALT, then in response to

(rename to:)

type **/ALT**.

In this way the directory /MAIN from the tape will be restored to the disk as /ALT.

In response to

Pathname 2:

type <**Return**>.

Remove the Boot/Utility Tape, and insert the PLAN 1000 Tape.

In response to the prompt

OK to do restore?

type **Y** <**Return**>.

Insert the tape and hit <Return> as instructed.

You will be informed that

Tape Label Contains:

PLAN 1000 (tm) PRINT SERVER VERSION 1.1
      COPYRIGHT 1981,1982,1983,1984,1985,1986,1987
      NESTAR SYSTEMS, INC.
      <DATE>

In response to

Is this the right tape?

type **Y** <**Return**>.

The program will proceed with its execution. The amount of
time that the restore will take depends upon the number of
volumes you are restoring; a full restore will take ten to twenty
minutes.

When the restoration is completed, you will be prompted to type
<**Return**> to continue. Select Q)uit. Then type <**Return**>.

The File Server Utility Menu will appear.

Now remove the Upgrade Tape and insert the Boot/Utility Tape.

Step 4. SETTING THE POINTER TO THE NEW BOOT
           VOLUME

From the File Server Utility Menu, select option H,
Examine/Modify Disk Contents, to run the program FILDEBUG.
Select F)ile mode.

The new file server boot volume that has been restored to the
hard disk is called

   /MAIN/SYSTEM/FILESERVER

Since the file server's boot volume has been restored using the Incremental Archive program, it is necessary to set a pointer to that volume. To do this, issue the command:

SETBOOT /MAIN/SYSTEM/FILESERVER

Step 5. BRINGING UP THE SYSTEM WITH THE NEW
SOFTWARE

Reboot your PLAN 3000 or PLAN 5000 file server by pressing the button on the back of the unit. Reboot your PLAN 4000 file server by removing the front panel labeled "File Server" and pressing the reset button above the key switch.

The message

Hit <ESC> for boot menu
Otherwise will boot from /1 in 5 seconds

will appear, followed by the message

File Server will start in 10 seconds
Press <ESC> for utility menu.

Do not hit <Esc> at either prompt. Allow the system to automatically boot and to chain to the file server software.

The banner displayed should indicate that you are now using File Server version 2.3 or greater.

Several programs (NWCMDS, PRINTQ, PLAN 1000) make use of a volume called /MAIN/SYSTEM/NAMES. This volume may already exist on your current system. Details on this volume can be found in Chapter 6. If your installation network has more than one file server, each file server must have a copy of this volume.

The PLAN 1000 you received is already addressed at $D0. If you have a station with this address on your network, you need to change the address of the print server.

Also, the two network volumes must be renamed, as follows:

From the net program

    RENAME /MAIN/SYSTEM/PROFILE/$D0,$xx
and
    RENAME /MAIN/SYSTEM/PRINTERS/CONFIG/$D0,$xx

Here xx is the new station address.

See Chapter 7 (Print Server Customization Tasks) for more information.

At this time you can also merge the FSCMD volumes, as described in Step 1 of this Section, if you wish.

Your PLAN 1000 installation is now complete.

3.3.2 Upgrading from File Server Version 2.3

If your File Server is Version 2.3, you will need to restore only a portion of the tape you have received.

Step 1. RESTORING THE NEW SOFTWARE

Insert the PLAN 1000 Version 1.1 tape into the tape drive.

Type **QUIT** on the file server console.

In response to the prompt

    Quitting file server
    are you sure (Y/N)?

type **Y** <**Return**>.

The File Server Utilities Menu will appear.

In response to the prompt

Enter a letter to select which utility to run:

type **B** <**Return**>.

You are now using the Incremental Archiver program.

Select the R)estore option.

In response to

Which files do you want to confirm restore for:

type **N** <**Return**>.

In response to

Overwrite any existing files?

type **Y** <**Return**>.

Note that this will overwrite only those volumes on disk that have the same name as the to-be-restored volumes from the tape

In response to

Rename files on disk?

type **N** <**Return**> if your disk is named /MAIN. Then, in response to

Pathname 1:

type **/MAIN/SYSTEM/PRINTERS** <**Return**>.

If your disk has a name other than /MAIN, type **Y** <**Return**>.

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The system will prompt for the volume name you wish to use. Respond with the name of the hard disk. For example, if the name of the hard disk is /ALT, then in response to

(rename to:)

type **/ALT/SYSTEM/PRINTERS** <Return>.

Thus the directory /MAIN/SYSTEM/PRINTERS from the tape will be restored to the disk as /ALT/SYSTEM/PRINTERS.

In response to

Pathname 2:

type <**Return**>.

In response to

OK to do restore?

type **Y** <**Return**>.

Insert the tape and hit <Return> as instructed.

You will be informed that

Tape Label Contains:

PLAN 1000 (tm) PRINT SERVER VERSION 1.1
    COPYRIGHT 1981,1982,1983,1984,1985,1986,1987
    NESTAR SYSTEMS, INC.
    <DATE>

In response to the prompt

Is this the right tape?

type **Y** <**Return**>.

The program will proceed with its execution. The amount of time that the restore will take depends upon the number of volumes that you are restoring; this partial restore will take approximately ten minutes.

When the restoration is completed, you will be prompted to type <**Return**> to continue. Select Q)uit. Then type <**Return**>.

The File Server Utility Menu will appear.

Select Option A, File Server, to bring up your system.

Several programs (NWCMDS, PRINTQ, PLAN 1000) make use of a volume called /MAIN/SYSTEM/NAMES. This volume may already exist on your current system. Details on this volume can be found in Chapter 6 (/MAIN/SYSTEM/NAMES). If your instal- lation network has more than one file server, each file server must have a copy of this volume.

The PLAN 1000 you received is already addressed at $D0. If you already have a station with this address on your network, you will have to change the address of this print server. Also, the following network volumes must be renamed, as follows:

From the net program

    RENAME /MAIN/SYSTEM/PROFILE/$D0,$xx
and
    RENAME /MAIN/SYSTEM/PRINTERS/CONFIG/$D0,$xx

Here xx is the new station address.

See Chapter 7 (Print Server Customization Tasks) for more information.

Your PLAN 1000 installation is now complete.

3.3.3 Upgrading Later Releases of File Server Version 2.3 and File Server Version 2.4

You will need to restore only a part of the tape you have received. (The later releases of File Server Versions 2.3 include SR5.1, SR5.2 and SR5.3.)

Step 1. RENAMING THE PREVIOUS PLAN 1000 SOFTWARE

At the file server console type the command

LIST //SYSTEM/PRINTERS,nested

You should see a volume named

//SYSTEM/PRINTERS/PRINTSERVER

and also at least one volume named

//SYSTEM/PRINTERS/VERSION/x.x

(where x.x is a version number). Rename the print server volume with the following command:

RENAME //SYSTEM/PRINTERS/PRINTSERVER,PRINTSERVER<x.x>

where <x.x> is the highest version you saw when listing the versions above.

Step 2. RESTORING THE NEW SOFTWARE

Insert the PLAN 1000 version 1.1 tape into the tape drive.

Type **QUIT** on the file server console.

In response to

> Quitting file server
> are you sure (Y/N)?

type **Y** <**Return**>.

The File Server Utility Menu will appear.

In response to

> Enter a letter to select which utility to run:

type **B** <**Return**>.

You are now using the Incremental Archiver program.

Select the R)estore option.

In response to

> Which files do you want to confirm restore for:

type **N** <**Return**>.

In response to

> Overwrite any existing files?

type **Y** <**Return**>.

Note that this will overwrite only those volumes
on disk that have the same name as the to-be-restored
volumes from the tape

In response to

> Rename files on disk?

type **N** <**Return**> if your disk is named /MAIN.

Then, in response to

Pathname 1:

type **/MAIN/SYSTEM/PRINTERS/PRINTSERVER** <**Return**>.

If your disk has a name other than /MAIN, type
Y <**Return**>.

You will be prompted for the volume name you wish to use.
Respond with the name of the hard disk. For example, if the name of the
hard disk is /ALT, then in response to

(rename to:)

type **/ALT/SYSTEM/PRINTERS/PRINTSERVER** <**Return**>

In this way the directory /MAIN from the
tape will be restored to the disk as /ALT.

In response to

Pathname 2:

type **/MAIN/SYSTEM/PRINTERS/VERSION** <**Return**>

If your disk has a name other than /MAIN, and you typed **Y**
<**Return**>, you will be prompted for the volume name you wish to use.
Respond with the name of the hard disk. For example, if the name of the
hard disk is /ALT, then in response to

(rename to:)

type **/ALT/SYSTEM/PRINTERS/VERSION** <**Return**>

In this way the directory /MAIN from the
tape will be restored to the disk as /ALT.

In response to

Pathname 3:

type <**Return**>.

In response to

OK to do restore?

type **Y** <**Return**>.

Insert the tape and hit RETURN as instructed.

You will be informed that

Tape Label Contains:

PLAN 1000 (tm) PRINT SERVER VERSION 1.1
    COPYRIGHT 1981,1982,1983,1984,1985,1986,1987
    NESTAR SYSTEMS, INC.
    <DATE>

In response to

Is this the right tape?

type **Y** <**Return**>.

The program will proceed with its execution. The amount of
time that the restore will take depends upon the number of
volumes that you are restoring; a full restore will take approxi-
mately ten minutes. When the restoration is completed, you will
be prompted to type <**Return**> to continue. Select Q)uit. Then
type <**Return**>.

The File Server Utility Menu will appear.

Select option A, File Server, to bring up your system.

Several programs (NWCMDS, PRINTQ, PLAN 1000) make use of a volume called /MAIN/SYSTEM/NAMES. This volume may already exist on your current system. Details on this volume can be found in Chapter 6. If your installation network has more than one file server, each file server must have a copy of this volume.

The PLAN 1000 hardware you have received has been assigned the address $D0. If you already have a station with this address on your network, you will have to change the address of this print server. Also, two network volumes may need to be renamed from the NET program, as follows:

    RENAME /MAIN/SYSTEM/PROFILE/$D0,$xx
and
    RENAME /MAIN/SYSTEM/PRINTERS/CONFIG/$D0,$xx

Here xx is the new station address.

Customers with more than one PLAN 1000 may need to use the TCOPY utility to create an additional copy of the above volume (each with its own station address) for each additional PLAN 1000 station. See Chapter 7 (Print Server Customization Tasks) for more information.

Your PLAN 1000 installation is now complete.

3.4 Installing the Print Server Software When Multiple File Servers Exist on the Network

The PLAN 1000 supports use of the print server with multiple file servers. When installing print server software and multiple file servers exist on the network, the following points should be considered:

(1) The print server boot volume should reside on only one file server. Print server configuration volumes must reside on the file server containing the boot volume.

(2) User software (e.g., SETPRINT) should be available on a shared library volume on each file server that is part of the print system.

Chapter 4

Print Server Volumes

4.0 Introduction

This chapter describes the volumes that configure the print
server. Volumes shipped with the print server allow you to turn
on your system and send print requests to one parallel printer.
To customize your system (for instance, attach more printers,
add more print setups, add more print servers or file servers),
you can modify the shipped volumes and also create new
volumes.

Specific customization tasks are described in Chapter 7.

To customize your system, the contents of the following
volumes can be modified:

    /MAIN/SYSTEM/PRINTERS/CONFIG/$D0
    /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE

These volumes are shipped with your print server software.
You may also have to create these volumes:

    /MAIN/SYSTEM/NAMES
    /MAIN/SYSTEM/PRINTERS/TRAILER/<name>
    /MAIN/SYSTEM/PRINTERS/PREPARE/<name>

4.1 Volumes Shipped with the Print Server Software

The print server software is shipped with the following volumes:

    /MAIN/SYSTEM/PROFILE/$D0   T = T
    /MAIN/SYSTEM/PRINTERS/PRINTSERVER   T = B
    /MAIN/SYSTEM/PRINTERS/CONFIG/$D0   T = T
    /MAIN/SYSTEM/PRINTERS/CHARSET   T = X
    /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE   T = T

The function of each volume is described in Section 4.2. Refer to Tables 4-1 and 4-2. The contents of the volumes:

/MAIN/SYSTEM/PRINTERS/CONFIG/$D0
/MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE

(as shipped) are listed here. The parameters in Table 4-1 are described in Chapter 5 and the parameters in Table 4-2 are described in Section 6.9.

Examine the contents of these volumes and read Chapters 5 and 6 to determine what, if anything, needs to be modified or created to customize your print server.

Table 4-1

Parameters Defined in
/MAIN/SYSTEM/PRINTERS/CONFIG/$D0
(as shipped)

;This is a sample configuration volume.

;Once you make any change to the volume, make sure to reset or reboot
;the print server.

;Two parallel printers and a serial printer are configured in this
;configuration volume.

;Currently only one parallel printer is "attached."

;Edit the printer parameter to attach or detach any printer as needed.

;Define the first printer as a parallel printer.
Printer = Printer1,device = parallel-1,header = example;
Prepare = parallel-1;

;Define the second printer as a parallel printer.
Printer = Printer2,device = parallel-2,header = example,detached:
Prepare = parallel-2;

;Define the third printer as a serial printer.
;Parameters set below are appropriate for the Apple Imagewriter.
;For other serial printers, consult the printers
;manual for values and edit the parameters accordingly.
Printer = Printer3,device = serial,header = example,detached;
Prepare = serial,baudrate = 9600,parity = none;

;For Apple Scribe, use the following parameters by removing the
;semicolons in the first column below and inserting semicolons in the
;first column of the directives for Apple Imagewriter above;
;Printer = Printer3,device = serial,header = example,detached;
;Prepare = serial,baudrate = 9600,parity = odd;

Table 4-2

Parameters Defined in
/MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE
(as shipped)

```
&BLOCK1 = &ID
&BLOCK2 = &ID
&BLOCK3 = &ID
&BLOCK4 = &ID
&BLOCK5 = &ID
&BLOCK6 = &ID
&BLOCK7 = &ID
&BLOCK8 = &ID
```

&date

Print request number &QNUM

Station: &STATION

Name: &NAME

File Server: &NFS (&NFSNO)

NFS Pathname: &PATH

Filename (s): &FILE
&FILE
&FILE
&FILE
&FILE
&FILE
&FILE
&FILE
&FILE

Print Server: &SERVER (&SERVNO)
Printer: &PRINTER
Setup: &SETUP
Eject: &EJECT

(NESTAR banner)

4.2 Volume Functions

This section describes the specific function of each volume used by the PLAN 1000 Print Server.

4.2.1 /MAIN/SYSTEM/PROFILE/$D0   T=T

This volume is shipped with your print server software. It contains the pathname of the print server boot volume:

/MAIN/SYSTEM/PRINTERS/PRINTSERVER

4.2.2 /MAIN/SYSTEM/PRINTERS/PRINTSERVER   T=B

This volume is shipped with your print server software and cannot be modified (T=B). It is the print server boot volume. /MAIN/SYSTEM/PROFILE/$D0 contains this pathname.

4.2.3 /MAIN/SYSTEM/NAMES   T=T

This volume is not shipped; you must create it. It contains the file server and print server station addresses and names (station addresses and names are linked in this way). The print server obtains its own name from this volume.

Chapter 6 describes this volume.

4.2.4 /MAIN/SYSTEM/PRINTERS/CONFIG/$D0   T=T

This volume is shipped with your print server software and contains parameters that can be modified to customize your print server.

Chapter 5 describes the syntax and default values of this volume.

4.2.5 /MAIN/SYSTEM/PRINTERS/CHARSET   T=X

This volume is shipped with the print server software and cannot be modified. It contains the character set used to print the user logo on the header and/or trailer pages of print requests.

4.2.6 /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE T=T

This volume, shipped with the print server software, contains the format for the header page of a print request and can be modified.

4.2.7 /MAIN/SYSTEM/PRINTERS/TRAILER/<name> T=T

This volume is not shipped with the print server software. When it is created, it contains the design for the optional trailer page of a print request and has the same format as the volume /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE.

4.2.8 /MAIN/SYSTEM/PRINTERS/PREPARE/<name> T=X

This volume is not shipped; you must create it. It contains device data that initializes the printers at startup.

4.3 Modifying a Volume

To modify a volume, TCOPY it to a DOS file and use the editor at your workstation to make changes. Then TCOPY it back to its pathname.

TCOPY is described in the *IBM PC Dos Reference Manual*.

Chapter 5

Parameters in the Configuration Volume

/MAIN/SYSTEM/PRINTERS/CONFIG/<name>

5.0 Introduction

This chapter describes the syntax of the parameters in the configuration volume:

/MAIN/SYSTEM/PRINTERS/CONFIG/<name>

/MAIN/SYSTEM/PRINTERS/CONFIG/$D0 is shipped with the print server software (Table 4-1 lists the contents of this volume). Parameters defined in this volume can be modified or other parameters can be added to customize your installation.

Parameters that can be set in this volume are:

(1) A password to protect access to the print server menu.

(2) The hours for overnight print jobs.

(3) File servers to be checked for print requests and whether the file server is attached.

(4) Information to be printed on the header or trailer pages of print jobs.

(5) The interval (in seconds) that the print server waits before re-checking the queues when they are empty.

(6) Printer information, for instance, printer name, setups, device type, the name of pathnames where header or trailer pages are defined and whether the printer is to be attached or not.

(7) The pathname of a preparation volume that contains infor-
mation to do a one-time initialization of printers.

(8) Baud rates, parity, data bits, and protocol for serial printers.

The configuration volume syntax is listed in Table 5-1. Parame-
ters consist of keywords, which are denoted by upper case, and
their assigned values, which are enclosed in angle brackets (<
>). Default values are enclosed in square brackets ([ ]).

Directives are delineated by spaces (and marked A through H
for the sake of explaining them in the following pages). Direc-
tives must be terminated with a semicolon (;) and cannot
exceed 255 characters.

Parameters may be specified in any order. Both upper and
lower case are permissible.

The valid delimiters to separate keywords from their values is an
equal sign (=) or a blank space. Blank spaces are also allowed
between assigned values. A comma (,) is used to separate two
parameters. A comma can be used to separate a
keyword/keyword pair and a value/value pair.

Comment lines must be preceded by a semicolon (;).

Table 5-1

/MAIN/SYSTEM/PRINTERS/CONFIG/<name> Syntax and Default Values

(A)   ;Comment lines

(B)   PASSWORD = <nnn>; [default: no password exists]

(C)   NIGHT = <starting hour>,<ending hour>; [default: 0,6]

(D)   FS,NAME = <symbolic FS name or station address>, DETACHED; [default: file server that the print server booted from]

(E)   CHARSET = <pathname>;

(F)   PSDELAY = <nn>; [default: 15 seconds]

(G)   QSCAN = <nn>; [default: 3]

(H)   PRINTER = <printer name> [default: whatever printer is available], SETUP = <forms name> [default: STANDARD], DEVICE = <device name>,HEADER = <pathname> [default: no header file exists],TRAILER = <pathname> [default: no trailer file exists],DETACHED;

(I)   PREPARE = <printer device name>,WITH = <prepare volume pathname> [default: no prepare volume exists], CRDELAY = <value> [default: 0],LFDELAY = <value> [default: 0],FFDELAY = <value> [default: 0], TIMEOUT = <value> [default: 5000],BAUDRATE = <value> [default: 9600],STOPBITS = <value> [default: 1], DATABITS = <value> [default: 8],PARITY = <parity string> [default: none], DSR/DTR, XON/XOFF, ENQ/ACK, ETX/ACK [default: DSR/DTR];

5.1 Parameter Definitions

Keywords and values are defined below.

(A)

;Comment lines

Comment lines are always preceded by a semicolon (;).

(B)

PASSWORD = <nnn>;

This parameter defines a password to the print server menu, where nnn can be up to 15 numeric characters (alphabetic and special characters not allowed because the PLAN 1000 has a numeric keypad). If a password is not defined, it is assumed that none exists.

(C)

NIGHT = <starting hour>,<ending hour>;

This parameter defines night time or off hour printing (on a 24 hour clock). Enter two integers between 0 and 23, separated by a space or comma, for example:

NIGHT = 22,6;

This sets night-time printing to the time between 10:00 p.m. and 6:00 a.m. The default is midnight to 6:00 a.m. (0,60.

(D)

FS, NAME = <symbolic FS name or station address>,
DETACHED;

This directive specifies the file server(s) that should be checked for print requests. The value specified after NAME can be a symbolic name or the address of the file server, for example:

FS,NAME = $FE;

or

FS,NAME = RESEARCH;

If you assign a symbolic name, the number of characters in the name should not exceed 15 characters.

Note: If FS has been assigned a symbolic name in /MAIN/SYSTEM/NAMES, it cannot be referred to by the station address in the configuration volume.

The print server will check for print requests only on the file servers specified here. Up to 32 file servers can be listed.

If you do not want a particular file server checked for print requests, add the optional word DETACHED to the FS line. The file server can be attached later, if desired, from the print server menu for the duration of the current print server execution (see Section 8.3.3), or permanently by editing the configuration volume and removing the word DETACHED.

If no FS parameters are defined then the file server that the print server booted from will be taken as the default file server.

(E)

CHARSET=<pathname>;

This parameter provides the pathname of a T=X volume containing the character set used to print the user logo on header and trailer pages. This volume cannot be edited.

This parameter is not specified in the shipped volume /MAIN/SYSTEM/PRINTERS/CONFIG/$D0; by default, the character set is defined in the shipped volume:

/MAIN/SYSTEM/PRINTER/CHARSET

Include this parameter only if the above volume has been renamed, in which case a new pathname will have to be specified. For instance, if you rename it to /MAIN/SYSTEM/PRINTER/CSET, you have to add a new line to the configuration volume:

CHARSET=/MAIN/SYSTEM/PRINTER/CSET;

(F)

PSDELAY=<nn>;

If the queue is empty, the print server will check it periodically for new print requests. The PSDELAY parameter specifies (in seconds) how often the print server will check the queue when it is empty. The valid range for this parameter is 1 to 3600 seconds. For example:

PSDELAY=20;

will cause the queue to be checked every 20 seconds. This parameter is not specified in the shipped configuration volume; by default, it is set to 15 seconds. In high print volume environments the PSDELAY value should be kept as low as possible.

(G)

QSCAN=<nn>;

This parameter allows each print server to be configured to scan a specific number of print requests in order to service them for an available second printer. The valid range for this parameter is 1 to 99. For example

QSCAN=25

will cause the print server to scan 25 print requests in the queue for servicing. This parameter is not specified in the shipped configuration volume; by default it is set to 3. In high volume environments QSCAN will take time and may affect performance; therefore, the QSCAN value should be as low as possible.

(H)

PRINTER=<printer name>,SETUP=<forms name>,
DEVICE=<device name>,HEADER=<pathname>,
TRAILER=<pathname>,DETACHED;

This set of parameters defines the printer name, setup name, device type, the name of the header and trailer volumes, and whether or not the printer is to be attached.

(1) The keyword PRINTER is followed by the symbolic name chosen for the printer. Printer names must be one word.

Since the print server can only accommodate three printers (parallel-1, parallel-2, and serial), only one printer name can be associated with a particular device type. However, if more than one name is defined for a particular device type then the first defined name will be used.

The same printer name can be specified more than once, on separate lines, associated with different SETUPs.

If no printer name is defined, then the device type (parallel-1, parallel-2 or serial) is taken as the default.

(2) The keyword SETUP is followed by the name of a print setup (Section 7.4 describes how to define a setup). Up to 15 setups can be defined. If no setup is specified, STANDARD is assumed (normal print mode).

(3) The keyword DEVICE is followed by the device type of the printer which can be either parallel-1, parallel-2, or serial.

(4) The keyword HEADER is followed by the name of the volume /MAIN/SYSTEM/PRINTERS/HEADER/<name> which contains the format for the header page. If a header volume is not specified, it is assumed that none exists. Therefore, if you do not want a header page do not include this parameter.

In /MAIN/SYSTEM/PRINTERS/CONFIG/$D0, the format for the header page is obtained from the volume:

/MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE

If the header volume pathname is:

/MAIN/SYSTEM/PRINTERS/HEADER/HEAD1

then you only need to specify HEAD1, for example:

HEADER=HEAD1

However, if the pathname does not begin with /MAIN/SYSTEM/PRINTERS/HEADER, then the entire pathname must be specified.

(5) The keyword TRAILER is followed by the name of the volume /MAIN/SYSTEM/PRINTERS/TRAILER/<name> that contains the format for the trailer page. If a trailer volume is not specified, it is assumed that none exists.

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Therefore, if you do not want a trailer page do not include this parameter.

If the trailer volume pathname is:

/MAIN/SYSTEM/PRINTERS/TRAILER/TRAIL1

then you only need to specify TRAIL1, for example:

TRAILER = TRAIL1

However, if the pathname does not begin with /MAIN/SYSTEM/PRINTERS/TRAILER, then the entire pathname must be specified.

(6) The printer is attached unless you specify the keyword DETACHED. If you detach it in the configuration volume, you can attach it later from the menu for the duration of the print server execution (see Section 8.3.4).

(I)

PREPARE = <printer device name>,WITH = <prepare vol pathname>,CRDELAY = <value>,LFDELAY = <value>, FFDELAY = <value>,TIMEOUT = <value>BAUDRATE = <value>, STOPBITS = <value>,DATABITS = <value>,PARITY = <parity string>,DSR/DTR,XON/XOFF,ENQ/ACK,ETX/ACK;

The PREPARE directive sends initializing information to a printing device. Initializing data varies according to the manufacturer of the printer.

Header and trailer volumes can also be used to send this data to printers (see Section 7.6).

Should more than one PREPARE directive be specified for a particular device, the last PREPARE parameter specified will be used to configure the device.

(1) The keyword PREPARE is followed by the printer device type which can be parallel-1, parallel-2, or serial.

(2) The WITH clause supplies the pathname of a T=T volume with the pathname:

    /MAIN/SYSTEM/PRINTERS/PREPARE/<prepare name>

which defines the initialization information for the printer (refer to Section 7.7.1).

If the prepare volume pathname is:

    /MAIN/SYSTEM/PRINTERS/PREPARE/PREP1

then you only need to specify PREP1, for example:

    WITH=PREP1

However, if the pathname does not begin with /MAIN/SYSTEM/PRINTERS/PREPARE the entire path-name must be specified.

If the WITH clause is not specified, it is assumed that no prepare volume exists.

(3) Some printers (especially slower ones) require delays after sending carriage returns. The values specified with the key-word CRDELAY cause the print server to pause the speci-fied amount of time before sending the next character. The value range for CRDELAY is:

    CRDELAY=0..511 ms

Default is 0.

(4) Some printers require delays after sending line feeds. The values specified with LFDELAY cause the print server to pause the specified amount of time before sending the next character. The value range for LFDELAY is:

LFDELAY=0..511 ms

Default is 0.

(5) Some printers require delays after sending form feeds. The values specified with FFDELAY cause the print server to pause the specified amount of time before sending the next character. The value range for FFDELAY is:

FFDELAY=0..511 ms

Default is 0.

(6) The TIMEOUT clause causes the print server to wait a specified amount of time for an acknowledgement from the printer. If the acknowledgement is not received within the specified time, an error in communication with the printer is indicated. The value range for TIMEOUT is:

TIMEOUT = 0..210000 ms (3 minutes, 30 seconds)

Default is 5000.

The following parameters apply to serial printers only.

(7) BAUDRATE specifies the speed of serial communication between the print server and the serial printer that is connected to it. Speed can also be specified by using the external clock value:

<*external_clock rate value>

Possible values for BAUDRATE are:

BAUDRATE = 16*external_clock TO 19200
(valid values are *external_clock for <16*external_ clock>, 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200)

Default is 9600.

(8) STOPBITS is required for communication with the serial port of the print server. Possible values are:

STOPBITS = 1..2

Default is 1.

(9) DATABITS is also required for communication with the serial port of the print server. Possible values are:

DATABITS = 5..8

Default is 8.

(10) The values for PARITY can be either ODD, EVEN, or NONE (the default is NONE).

(11) Protocols that can be used include XON/XOFF, ENQ/ACK, ETX/ACK and DSR/DTR. If a protocol keyword is not specified, the print server will use DSR/DTR as the default serial communication protocol.

Only one protocol should be specified.

Appendix C defines the values for each protocol.

Refer to Table 5-2 below for an example of PREPARE directives.

Table 5-2

Sample PREPARE Directives

PREPARE = PARALLEL-1, WITH = PREPFILE;

A parallel printer is configured with initializing information from /MAIN/SYSTEM/PRINTERS/PREPARE/PREPFILE.

PREPARE = SERIAL, XON/XOFF;

XON/XOFF protocol is used with a serial printer.

**PREPARE = SERIAL, WITH = PREP1FILE,
PARITY = ODD, TIMEOUT = 30, BAUDRATE = 9600, XON/XOFF;**

A serial printer is configured with initialization information from /MAIN/SYSTEM/PRINTERS/PREPARE/PREP1FILE. Odd parity, a timeout of 30 ms, a baudrate of 9600 and XON/XOFF protocol are specified.

A sample configuration volume is listed in the table below.

Table 5-3

Sample Customized Configuration Volume

```
; LAST MODIFIED: MON 08-Apr-1986 11:14:05
; This is Print Server LENIN

;*** Set console password***
PASSWORD=13691215;

NIGHT=23,6;
FS,NAME=MAIN;
FS,NAME=BLDG2,DETACHED;
PSDELAY=10;

PRINTER=R&D,SETUP=STANDARD,DEVICE=PARALLEL-1,
    HEADER=R&DHDR,TRAILER=R&DTRLR;
PRINTER=LINEPRINTER,SETUP=CHECKS,DEVICE=SERIAL,
    HEADER=LINEHDR;

PREPARE=PARALLEL-1,WITH=PREPARE1;
PREPARE=SERIAL,WITH=PREPARE2,XON/XOFF;
```

In the example configuration volume above, a console password has been set. Overnight print hours have been set to the hours between 11:00 p.m. and 6:00 a.m. A print server specified as MAIN will be checked for print request, as will BLDG2 which is detached. The print server, when it is empty, will check the queue every ten seconds for print requests.

The parallel printer R&D uses setup STANDARD. The header format is contained in a volume named

/MAIN/SYSTEM/PRINTERS/HEADER/R&DHDR

and the trailer format is defined in

/MAIN/SYSTEM/PRINTERS/TRAILER/R&DTRLR

The serial printer LINEPRINTER uses setup CHECKS with the header format defined in the volume

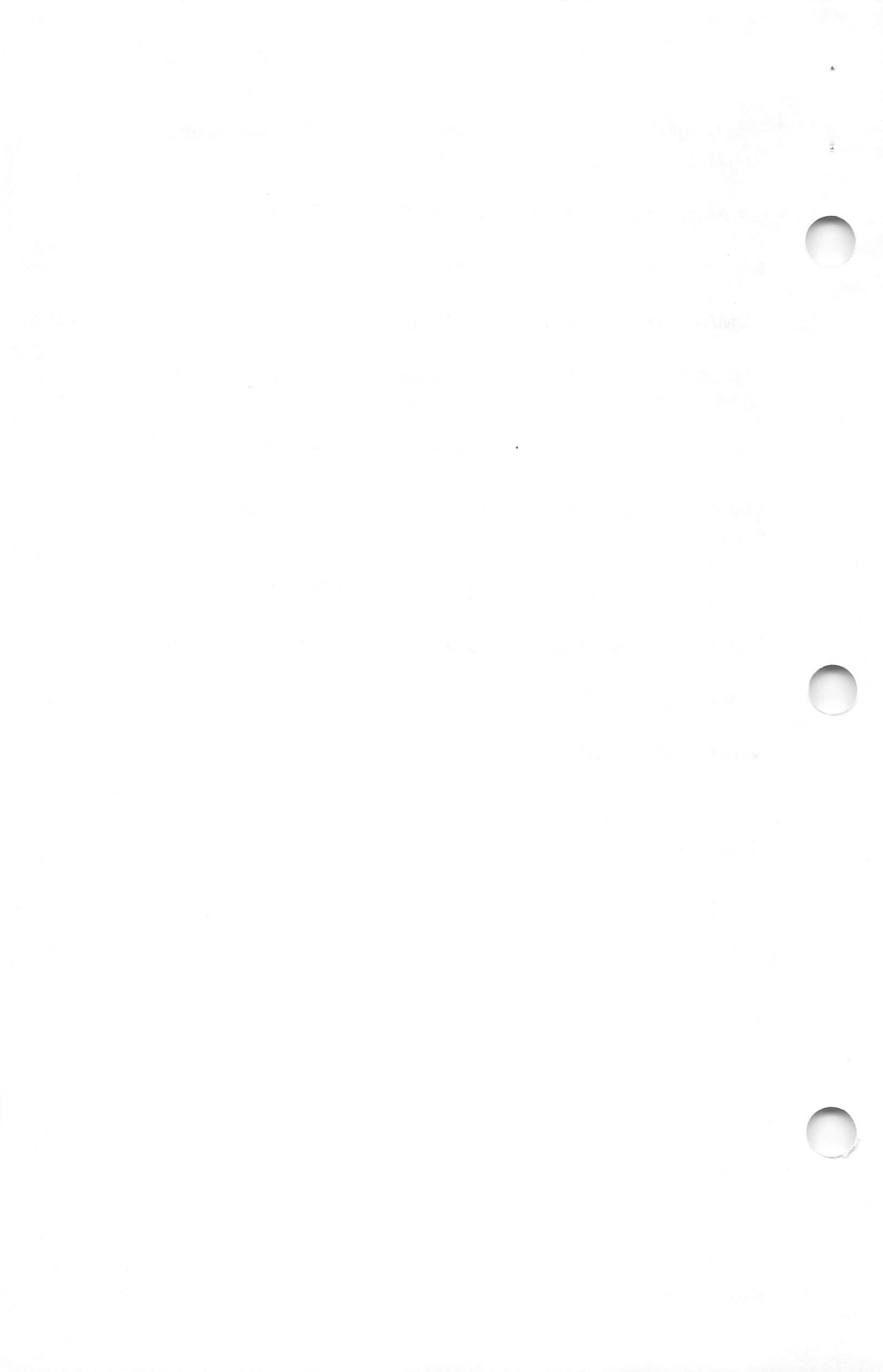/MAIN/SYSTEM/PRINTERS/HEADER/LINEHDR

The parallel printer is configured with initialization information from

/MAIN/SYSTEM/PRINTERS/PREPARE/PREPARE1

The serial printer is configured with initialization information from

/MAIN/SYSTEM/PRINTERS/PREPARE/PREPARE2

with XON/XOFF protocol.

Chapter 6

/MAIN/SYSTEM/NAMES

6.0 Introduction

The PLAN 1000 Print Server obtains the following information
from the volume /MAIN/SYSTEM/NAMES:

- The station addresses of all file servers on the network.
- The symbolic names of all file servers on the network.
- The symbolic name of the print server itself.

If a file server on the network is not assigned a symbolic name
in this volume, its station address is used as a symbolic name.
If the file server is assigned a symbolic name, it cannot be
referred to by station address in the configuration volume; it
must be referred to by the symbolic name you assign.

If the print server is not assigned a symbolic name in this
volume, its station address is used as a symbolic name. If the
print server is assigned a symbolic name, the pathname of the
configuration volume must contain the same name; for instance,
if you set the symbolic name for your print server to be RALPH
in /MAIN/SYSTEM/NAMES, you must name a configuration
volume /MAIN/SYSTEM/PRINTERS/CONFIG/RALPH.

6.1 Creating /MAIN/SYSTEM/NAMES

To create /MAIN/SYSTEM/NAMES, create a DOS file and
define the names of the file servers on the network using the fol-
lowing syntax:

    fs,station=<file server station address>,name=<symbolic
    name>;

For instance:

FS,STATION=$FE,NAME=BONZINI;

To define the names of print servers on the network use the following syntax:

ps,station=<print server station address>,name=<symbolic name>;

For instance:

PS,STATION=$D0,NAME=FRED;

The number of characters in the symbolic name must not exceed 15 characters.

TCOPY the DOS file to the pathname /MAIN/SYSTEM/NAMES.

Chapter 7

Print Server Customization Tasks

7.0 Introduction

This chapter describes how to:

- Name the print server (Section 7.1).

- Change the print server station address (Section 7.2).

- Change the name of the printer(s) (Section 7.3).

- Change and/or add setups (Section 7.4).

- Configure the print server to support multiple file servers (Section 7.5).

- Attach a second parallel printer (Section 7.6).

- Attach a serial printer (Section 7.7).

- Add another print server to the system (Section 7.8).

- Change the header/trailer pages of the print job (Section 7.9).

- Set protection on the print server menu (Section 7.10).

- Define overnight print hours (Section 7.11).

- Define how often queues should be checked for print requests (Section 7.12).

7.1 Naming the Print Server

Volumes shipped with the print server software define the print server as station address $D0. You can give it a name which may be easier for you to remember.

Create a file (with any filename) and enter this line:

    PS, STATION=$D0, NAME=<name>;

For example:

    PS, STATION=$D0, NAME=ACCTG;

TCOPY this file to the pathname /MAIN/SYSTEM/NAMES. Then copy /MAIN/SYSTEM/PRINTERS/CONFIG/$D0 to a new pathname, replacing $D0 with the name you used above, for example:

    /MAIN/SYSTEM/PRINTERS/CONFIG/ACCTG

Note: Once you assign a symbolic name to the file server (in /MAIN/SYSTEM/NAMES), it cannot be referred to by the station address in the configuration volume.

7.2 Changing the Print Server Station Address

The print server address is set when shipped as $D0. If you want to change the address to something else ($D0 may already be assigned), copy the configuration volume to a new pathname, replacing $D0 with the address desired, or rename the configuration volume.

For example, suppose you already have a file server on the network with station address $D0 so you want to change the print server address to $D1. Copy the configuration volume to the new pathname:

    /MAIN/SYSTEM/PRINTERS/CONFIG/$D1

or rename it, replacing the last part of the pathname containing $D0 with the new address.

7.3 Changing the Name of the Printer(s)

You can attach up to three printers to the print server (two parallel and one serial). They have been defined in the shipped configuration volume as:

Printer-1
Printer-2
Printer-3

To change the name of the printer, TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a file. In the line that defines the printer name:

Printer=Printer1

change 'Printer1' to the name you want, for example:

Printer=Toshiba

TCOPY this file back to the configuration volume.

7.4 Adding/Changing Printer Setups

Print setups are specific parameters that define the type of document to be printed, for instance checks and labels, and the style, for instance, fonts, ribbon colors, paper sizes, page lengths, etc.

Suppose three printers are attached to the print server and you want one to process checks, one to process labels, and one to process letters. Print setups will have to be defined for each printer.

Refer to Table 4-1; in the configuration volume shipped with the print server software it appears that no setup has been defined

because the keyword SETUP is not defined:

    Printer=Printer1,device=parallel-1,header=example;

When SETUP is not specified a default of STANDARD (normal print mode) is assumed.

To add another print setup, TCOPY the volume /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a file and create a new line, duplicating the parameters:

    Printer=<printer name>,device=<device name>,header=
    <pathname>;

and add the keyword SETUP with the name of the setup you want, for example:

    Printer=Printer1,device=parallel-1,header=example,setup=letter;

Decide which setup you want to be utilized when the print server is first executed, then add the word 'detached' to the other set-ups, for example:

    Printer=Printer1,device=parallel-1,header=example,setup=letter;
    Printer=Printer1,device=parallel-1,header=example,setup=checks,
    detached;

In this example, setup checks is detached and setup letter will be utilized at startup. You can attach and detach setups without modifying the configuration volume by using the print server menu (see Section 8.3.5).

TCOPY the file to /MAIN/SYSTEM/PRINTERS/CONFIG/<name>.

7.5 Supporting Multiple File Servers

The print server can be configured to check for print requests on more than one file server.

For the sake of this explanation, assume there are three file

servers on the network but you want the print server to check only two for print requests.

Modify the Configuration Volume

TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a file. The syntax for the parameter that defines the file servers is:

FS,NAME=<symbolic FS name or station address>,[detached];

In this example, three new lines must be added to the configuration volume (because there are three file servers). For example:

FS,NAME=ACCTG;
FS,NAME=MKTG;
FS,NAME=RESEARCH,DETACHED;

Notice that file server RESEARCH is specified as detached; the print server will not check this file server for print requests. The file server can be attached later using the print server menu (see Section 8.3.3).

TCOPY the file to /MAIN/SYSTEM/PRINTERS/CONFIG/<name>.

Create the Volume /MAIN/SYSTEM/NAMES

You must also create the volume:

/MAIN/SYSTEM/NAMES

and define file servers using the following syntax:

fs,station=<file server station address>,name=<file server name>;

Create a DOS file (with any filename) and define the file servers using the syntax described above, for example:

FS,STATION=$FC,NAME=ACCTG;
FS,STATION=$FD,NAME=MKTG;

FS,STATION=$FE,NAME=RESEARCH;

Then TCOPY the file to the pathname /MAIN/SYSTEM/NAMES.

7.6 Attaching a Second Parallel Printer

The shipped configuration volume contains parameters that
define two parallel printers and one serial printer but only one
parallel printer is specified as attached. This section describes
how to attach a second parallel printer.

For the sake of this explanation, assume you are adding a
Toshiba printer to the system.

Modify the Configuration Volume

TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a file
and modify the lines that define the second parallel printer. The
syntax in /MAIN/SYSTEM/PRINTERS/CONFIG/$D0 is:

   Printer=Printer2,device=parallel-2,header=example,detached;

To specify that you are attaching a Toshiba printer, change the
line accordingly:

   Printer=Toshiba,device=parallel-2,header=Toshiba;

In this example, two printers will now be attached when the print
server boots up. You can also specify one printer as detached
and attach it later with the print server menu (see Section 8.3.4).

Notice that the name of the header volume changed. You must
add a new parameter to the header volume for this printer; this
process is described below.

TCOPY the file to /MAIN/SYSTEM/PRINTERS/CONFIG/<name>.

Modify the Header Volume

You may need to add a parameter to the header volume

/MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE and copy it to a new pathname. TCOPY it to a DOS file and add this line to the top of the file:

&HEX=abcdef...

where each character represents an 8-bit hex number that defines printer setups (for example, ESC sequences, tabs, line length and width, etc.). For example:

&HEX=1B1A49

sends the ASCII sequence ESC/SUB/1 ($1B/$1A/$49) to the printer. Many daisywheel printers interpret this sequence as a RESET command.

This information is dependent on the type of printer you are using; consult the manufacturer's manual.

TCOPY the file back to the new pathname /MAIN/SYSTEM/PRINTERS/HEADER/<name>. The header volume needs a new name (since it has information applicable to the second parallel printer only). This means that a header volume must be created for each printer you attach.

Add this new header pathname to the configuration volume where the header volume pathname is defined, for example:

HEADER=/MAIN/SYSTEM/PRINTERS/HEADER/TOSHIBA

7.7 Attaching a Serial Printer

Defaults in the shipped configuration volume define the serial printer as follows:

Printer=Printer3,device=serial,header=example,detached;
Prepare=serial,baudrate=9600,parity=none;

If this is appropriate for your installation, attach the serial printer from the print server menu (see Section 8.3.4).

Note: No protocol is specified in the configuration volume as it is shipped; when no protocol is specified, DTR/DSR is assumed.

If the defaults provided are not adequate for your serial printer, consult the printer's manual for values and edit the parameters accordingly.

If your serial printer requires printer setups, TCOPY /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE to a DOS file and add the &HEX parameter at the top of the file (see Section 7.6). Then TCOPY it back to a new name, for example:

/MAIN/SYSTEM/PRINTERS/HEADER/PRINTER3

and add this pathname to the configuration volume, for example:

HEADER =/MAIN/SYSTEM/PRINTERS/HEADER/PRINTER3;

7.7.1 The Prepare Volume

If your printer requires a one time initialization (for instance, a laser printer requires that you define fonts at startup), you must create a prepare volume with the pathname:

/MAIN/SYSTEM/PRINTERS/PREPARE/<name>

This pathname must then be included in the configuration volume with the PREPARE directive.

To create a prepare volume, consult Nestar's Technical Support Department.

7.8 Adding Another Print Server to the Network

To add another print server to the network, create a new configuration volume or TCOPY the existing volume, renaming it with the station address of the new print server, for example:

/MAIN/SYSTEM/PRINTERS/CONFIG/$D1

Parameters in the new configuration volume must be added or modified to reflect the new printer names, setups, night time printing hours, etc.

TCOPY /MAIN/SYSTEM/NAMES to a DOS file and add the name and address of the new print server, for example:

PS,NAME = OPS,STN = $D1;

7.9 Changing the Header/Trailer Pages of a Print Job

The volume /MAIN/SYSTEMS/PRINTERS/HEADER/EXAMPLE, shipped with the print server software, contains the format for the header page of a print request; it is also used for the design of the trailer page. To change the information displayed on the header page of your print job or to create a trailer page, perform the following tasks.

TCOPY /MAIN/SYSTEM/PRINTERS/HEADER/EXAMPLE to a DOS file. The contents of this volume are listed in Table 4-2.

The parameters in this volume can be modified and arranged in any order on the page. Parameters are defined below.

&HEX defines printer setups.

&BLOCK combined with &ID, prints the user identification on the page (must be repeated eight times).

&ID specifies the user identification. For example, if Tom specifies:

&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID
&BLOCK = &ID

at the top of the header volume the following will appear on the header page of his print request:

```
TTTTTT      OOO       M           M
   T       O   O      M M     M M
   T       O   O      M  MM    M
   T       O   O      M        M
   T       O   O      M        M
   T       O   O      M        M
   T        OOO       M        M
```

&DATE specifies the date and time.

&QNUM specifies the queue number assigned by the print server.

&STATION specifies the user station number in hex.

&NAME specifies the user's name.

&NFS specifies the file server (where the print request came from).

&NFSNO specifies the file server station address.

&PATH specifies the pathname of the file that is being printed.

&FILE specifies the file being printed.

&SERVER specifies the name of the print server (if defined).

&SERVNO specifies the station address of the print server.

&PRINTER specifies the printer name.

&SETUP specifies the printer setup name.

&PRIORITY specifies the priority of the print job (low, standard, high, overnight).

&COPIES specifies the number of copies to be printed.

&EJECT specifies the page length.

&ERRMSG specifies an error message if the job cannot be printed.

TCOPY the file to the pathname:

/MAIN/SYSTEM/PRINTERS/HEADER/<name>

or

/MAIN/SYSTEM/PRINTERS/TRAILER/<name>

7.10 Setting Protection on the Print Server Menu

The PLAN 1000 Print Server has a menu to facilitate system maintenance and reconfiguration. You may want to set a pass-word to limit access to this menu.

To set a password on the menu, TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a DOS file and enter the PASSWORD parameter:

PASSWORD = <nnn>;

where nnn can be up to 15 numeric characters (alphabetic and special characters not allowed). The configuration volume is shipped with no password defined.

TCOPY the file back to the configuration volume.

7.11 Defining Overnight Print Hours

An option exists that allows users to specify a print job as 'over-night'; this option is useful for long print jobs.

TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a DOS file and specify the NIGHT keyword with two integers between 0 and 23 (this is a 24 hour clock), for example:

NIGHT=23,5;

In the above example, overnight printing is set to the hours between 11:00 p.m. and 5:00 a.m. In the configuration volume shipped with the print server software NIGHT is not defined but a default of midnight to 6:00 a.m. is assumed.

TCOPY the file back to the configuration volume.

7.12 Defining How Often Queues Should be Checked for Print Requests

You can specify how often you want the print server to check the print queue (if it's empty) for print requests in the configuration volume.

TCOPY /MAIN/SYSTEM/PRINTERS/CONFIG/<name> to a DOS file. Add the PSDELAY parameter with the number of seconds you want the print server to wait before re-checking the queue, for example:

PSDELAY=30;

In the above example, the queue will be checked every 30 seconds. PSDELAY is not specified in the configuration volume shipped with your system but a default of 15 seconds is assumed.

TCOPY the file back to the configuration volume.

Chapter 8

Using the Print Server

8.0 Introduction

This chapter describes how to use the print server once it is installed and configured. Topics discussed include:
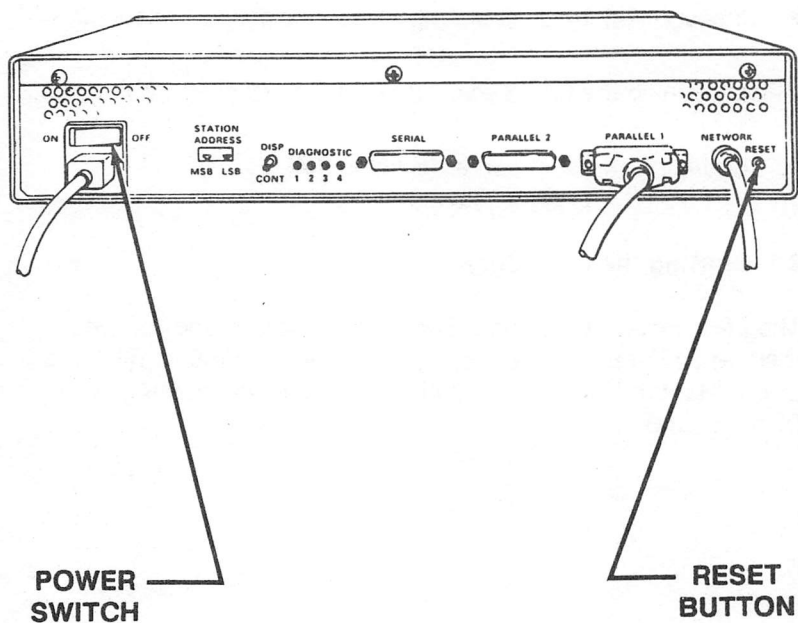
- Starting the print server (Section 8.1).

- Messages on the print server console display (Section 8.2).

- Maintaining the print server using the menu (Section 8.3).

- Turning off the print server (Section 8.4).

8.1 Starting the Print Server

The print server starts automatically at power-on and can be restarted by pressing the reset button (see Figure 8-1). There is also a 'Restart Print Server' option in the console menu (see Section 8.3.6).

Figure 8-1

**The PLAN 1000 Print Server Power-on
and Reset Button**

POWER
SWITCH

RESET
BUTTON

At startup, the print server self-tests.

Four LEDs (Light Emitting Diodes) located at the back of the print server act as diagnostic indicators.

If an error occurs, error messages appear on the print server display (see Appendix B for a description of diagnostic error messages).

All LEDs should come on immediately for a short time, accompanied by a beep, then go off. This indicates that the LEDs are working. If no LEDs remain on, then all components are functioning properly.

During the initial self-test, a Nestar banner appears on the console display. 20-25 seconds later, the following message appears:

| Press ATTN key to abort startup |

Any key on the keypad serves as an ATTN key.

Press the ATTN key within a few seconds to abort startup; otherwise, the print server will start up. If you press the ATTN key, the following message is displayed:

| Press ATTN key to restart |

The print server will not start until you press the ATTN key.

If the initial boot attempt fails, the self-test process begins again. The Nestar banner and the print server station address appear on the display during self-test.

Figure 8-2

The PLAN 1000 Console Display
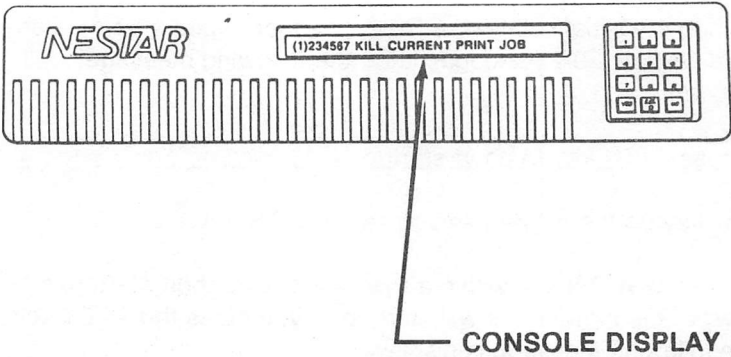
CONSOLE DISPLAY

8.2 Messages on the Print Server Console Display

Print server information appears on the console display. The message:

| Checking and servicing print requests |

is normally displayed. More detailed information is displayed if the 'Display/Suppress Messages' option from the menu is invoked (see Section 8.3.7).

A message appears on the display for two seconds which is then overwritten by the next message. In the following example, each message overwrites the next:

| 16:18 Connecting to FS Central |

| 16:18 Connecting to FS Secondary |

| 16:25 Servicing FS Secondary |

| 16:25 Checking FS Central |

In this example, the configuration volume specifies that print requests from two file servers named Central and Secondary are being serviced. After checking the QUEUE volumes for both file servers and finding no print requests, the print server waits, rechecking the queue directories periodically. A few seconds later, the print server finds requests waiting on Secondary and begins to queue them. The print server also continues to check Central.

If the print server is not currently printing jobs, the following message is displayed:

| (x) The PS is ready |

This example indicates that the print server will wait 'x' seconds before looking for new print requests. You can set how often the print server will look for print requests in the configuration volume (see Chapter 5 and Section 7.12).

8.3 Maintaining the Print Server Using the Menu

The print server console menu allows you to kill or defer print jobs, attach or detach file servers, printers, and print setups, restart the print server, and display or suppress print server messages.

The print server display is a 1 line by 40 column window (see Figure 8-2). The only input accepted is <0-9>, <Yes> and <No>. Press the buttons on the keypad to enter this input.

Press <Yes> to access the menu. If a password has been set for console protection (see Chapter 5 and Section 7.10), the print server prompts for the password before displaying the first option line of the menu. If you fail to enter the correct password after three attempts, the print server resumes normal activity.

Menu options include:

| (1)234567 Kill current print job |

| 1(2)34567 Defer current print job |

| 12(3)4567 Attach/Detach file server |

| 123(4)567 Attach/Detach printer |

| 1234(5)67 Attach/Detach print setup |

| 12345(6)7 Restart print server (x.x) |

| 123456(7) Display/Suppress PS messages |

When you initially press <Yes> the first option appears:

| (1)234567 Kill current print job |

Enter the option number to select a specific option. If you do not select a menu item within 30 seconds, the print server exits from the menu and resumes normal operations.

After you select an option, press <Yes> to activate the option.

Press <0> at any time to return to the main menu. If you are already at the main menu, pressing <0> will cause the print server to exit the menu and resume normal activity.

Typing a response before the prompt is not allowed and will be ignored.

Note: Changes made at the console remain in effect only until the print server is restarted. At that time, the original parameters defined in the configuration volume are restored.

8.3.1 Kill Current Print Job

```
(1)234567 Kill current print job
```

Press <1> and <Yes> to activate this option. The print server responds:

```
Kill <qnumber> <userid> on <printer name>?
```

where *qnumber* is the number assigned to the spooled job by the print server, *userid* is the value set in the user's default file, e.g., FRED, or the user station number, e.g., $40, and *printer name* is the printer designated in your configuration volume.

If you want to kill the current print job on this printer, press <Yes>. Printing is suspended and the job terminated.

If you want to kill the current print job on a printer other than the one specified in the display, press <No>. The print server displays the next printer with a job printing on it. When the last printer name specified in the configuration volume has been displayed you are returned to the 'Kill Current Print Job' option.

If no jobs are printing on any of the connected printers, this message is displayed:

```
No active job to kill
```

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8.3.2 Defer Current Print Job

```
1(2)34567 Defer current print job
```

Press <2> and <Yes> to activate this option. The print server responds:

```
Defer <qnumber> <userid> on <printer name>
```

where *qnumber* is the number assigned to the spooled job by the print server, *userid* is the value set in the user's defaults file, e.g., FRED, or the user station number, e.g., $40, and *printer name* represents one of the printers designated in your configuration volume.

If you want to defer the current print job on this printer, press <Yes>. Printing is suspended and the job printed at a later time.

If you want to defer the current print job on a printer other than the one displayed on the console, press <No>. The file server console displays the next printer with a job printing on it. When the last printer name specified in the configuration volume has been displayed you are returned to the 'Defer Current Print Job' option.

If no jobs are printing on any of the connected printers, then the following message appears:

```
No active job to defer
```

8.3.3 Attach/Detach File Server

```
12(3)4567 Attach/Detach File Server
```

Press <3> and <Yes> to activate this option.

Detaching an Attached File Server

If the file server is attached the print server responds:

```
FS <fs name> $<station number> attached; detach?
```

If you want to detach the currently displayed file server, press
<Yes>. If a job from this file server is still printing when you
detach it, the following message appears:

Will detach FS <FS name>

The print server will terminate the job and display:

FS <FS name> detached

If you do not wish to detach the currently displayed file server
press <No>. The console will display the next file server
defined in the configuration volume and ask if you want to
detach it.

At the end, when the system has checked every file server
specified in the configuration volume, you are returned to the
'Attach/Detach File Server' option.

Attaching a Detached File Server

If the file server is currently detached, the print server responds:

FS <fs name> $<station number> detached; attach?

If you want to attach the currently displayed file server, press
<Yes>.

When the currently displayed file server is successfully
attached, the console will display:

FS <FS name> attached

If the file server cannot be attached for some reason, the follow-
ing message appears:

Unable to attach to FS <FS name>

If you do not wish to attach the currently displayed file server,
press <No>. The console will display the next file server
defined in the configuration volume and ask if you want to attach
it.

At the end, when the system has checked every file server specified in the configuration volume, you are returned to the 'Attach/Detach File Server' option.

8.3.4 Attach/Detach Printer

123(4)567 Attach/Detach Printer

Press <4> and <Yes> to activate this option. If the printer is attached, the print server responds:

Printer <printer name> attached; detach?

Or, if the printer is detached:

Printer <printer name> detached; attach?

If this is the printer that you want attached or detached, press <Yes>.

If this is not the correct printer, press <No>. The next printer name in the configuration volume will be displayed. When all printer names in the configuration volume have been displayed you are returned to the 'Attach/Detach Printer' option.

8.3.5 Attach/Detach Print Setup

1234(5)67 Attach/Detach Print Setup

Press <5> and <Yes> to activate this option.

Detaching an Attached Print Setup

If the print setup is attached, the following message is displayed:

<printer name> <setup name> attached; detach?

If this is the setup you want detached press <Yes>. If this is not the setup you want detached, press <No>. The console will display the next setup found in the configuration volume. When

no more print setups are found in the configuration volume you are returned to the 'Attach/Detach Print Server' option.

When you detach a print setup, the job currently printing on the designated printer device will continue to completion. However, jobs designated to be printed on the printer with this setup will not be printed.

Attaching a Detached Print Setup

If the print setup is detached, this message is displayed:

| <printer name> <setup name> detached; attach? |

If this is the setup you want attached, press <Yes>. If this is not the setup you want attached, press <No>. The console will then display the next setup found in the configuration volume. When no more print setups are found in the configuration volume you are returned to the 'Attach/Detach Print Server' option.

Once a print setup has been attached, jobs with the appropriate setup will be printed. If the print setup cannot be attached for some reason a message is displayed indicating that the setup cannot be attached.

8.3.6 Restart Print Server

| 12345(6)7 Restart print server (x.x) |

Press <6> and <Yes> to activate this option. The print server responds:

| Do you really want to restart PS x.x? |

Press <No> if you've decided against the whole thing; you are returned to the 'Restart Print Server' option of the menu.

Press <Yes> to restart the print server. The following message is displayed:

| OK--restarting print server |

All active jobs are deferred.

Note: The print server reverts to the parameters defined in the configuration volume. Any changes made at the console (for instance, attaching a printer) are lost.

8.3.7 Display/Suppress PS Messages

| 123456(7) Display/Suppress PS messages |

Press <7> and <Yes> to activate this option. The print server responds:

| Messages suppressed; display them? |

Press <Yes> if you want print server information displayed. The print server will respond:

| Messages will be displayed |

and return to the 'Display/Suppress Messages' option of the menu. Messages are displayed when you leave the menu.

To stop the display of print server information, press the ATTN key and select the 'Display/Suppress Messages' option from the menu. The following message appears:

| Messages displayed; suppress them? |

Press <Yes> if want to stop displaying the messages. The print server displays the following message:

| Messages will be suppressed |

If you press <No>, you are returned to the 'Display/Suppress Messages' option.

8.4 Tracking Print Requests with PRINTQ

PRINTQ is a queue management program that allows you to inspect queued print requests. It runs on a user station independent of the print server.

For information on how to use PRINTQ, refer to Section 3 of the *IBM PC Dos Reference Manual.*

8.5 Turning Off the Print Server

If, for any reason, the print server must be turned off **all** file servers should be detached using the 'Attach/Detach File Server' option from the print server menu. Wait until messages appear on the print server display indicating that each file server has been detached. Then turn off the print server.

Appendix A

An Overview of Print Server Operations

A.0 Introduction

This chapter provides a technical description of print server operations.

A.1 Software Overview

Print server software runs in the PLAN 1000. T=T volumes associated with the software provide configuration parameters. The parameters can be modified by the system manager using TCOPY and an editor at a network workstation.

The way the print server processes a print request is described below.

The User Makes a Print Request

A user spools text or data to a virtual printer.

A Print Request is Queued

The virtual print driver in the user's workstation creates a print request volume from the file names and print options the user and system manager have specified (see Section A.3) called:

/MAIN/SYSTEM/QUEUE/NEW/<timestamp.$xx>

on the workstation's default file server.

Print Server Software Processes the Print Request

The print server software services new request volumes in

/MAIN/SYSTEM/QUEUE/NEW on the file server(s). When it finds any new request volumes, it moves them to /MAIN/SYSTEM/QUEUE/REC and then lists them in /MAIN/SYSTEM/QUEUE/MASTER (one request per block). /MAIN/SYSTEM/QUEUE/MASTER keeps a record of active, waiting, and completed print requests.

The files specified by each request are printed in order of priority. Completed requests are then removed from /MAIN/SYSTEM/QUEUE/REC.

Some requests remain waiting in the queue because their parameters are incorrectly entered or currently unavailable.

Currently unavailable parameters can be entered by customizing the configuration volume from a workstation.

The pathname of the configuration volume that specifies print server parameters is:

   /MAIN/SYSTEM/PRINTERS/CONFIG/<name>

where *name* is the name or address of the print server as specified in /MAIN/SYSTEM/NAMES. Header and trailer information is stored in the volumes:

   /MAIN/SYSTEM/PRINTERS/HEADER/<name>

and

   /MAIN/SYSTEM/PRINTERS/TRAILER/<name>

where *name* represents the header volume name and the trailer volume name, respectively.

Initializing information for a printing device is found in the volume:

   /MAIN/SYSTEM/PRINTERS/PREPARE/<name>

where *name* is the name of your prepare volume (see Chapter 5

and Section 7.7.1).

Printing the Job

A header and/or trailer page is usually printed with each job. These pages contain information about the print request, for instance, the name(s) of the files being printed, and other information such as a user logo. After printing the header page, the print server retrieves the body of the file from storage or from a spooled file and prints it.

A.2 The Print Server Text Volumes

The volume /MAIN/SYSTEM/PRINTERS/CONFIG/<name> contains information to configure the print system. Parameters such as printer names, overnight hours, and file server names and addresses are set by the values found in this volume.

All possible file servers, printers, and print setups should be included in the configuration volume, then be attached or detached using the menu at the print server console. Print server menu options are discussed in Chapter 8.

A.3 Contents of Print Request Volumes

Request volumes containing spooled material include the following information:

```
REQTYPE: PRINT
PRIORITY: HIGH/STANDARD/LOW/OVERNIGHT
DATE: <date>
TITLE: <title string>
STATION: <user station>
TITLELINE: YES/NO
USER: <user identification>
ID: <user identification>
NAME: <user identification>
SPOOLED: YES/NO/TEXT/DATA
```

TAG: <identification string>
FILE SERVER: <FS where print files reside>
FILE: <list of filenames to print>
PATH: <pathname of user volume>
COPIES: <number of copies>
EJECT: <lines per page>
SERVER: <print server name>
PRINTER: <printer model name>
SETUP: <forms name>

In addition, spooled requests contains the actual text or data to be printed.

A.4 Spooled Output and Virtual Printing

Spooled output is text that actually resides within a request volume, i.e., the request volume contains the text to be printed. Various application programs, for instance, The Messenger Electronic Mail program, include text to be printed in print request volumes.

In some environments, spooled output may be sent via a virtual printer. (To find out if you have virtual printing, see the *PLAN Series IBM PC DOS Reference Manual* or *PLAN Series Apple Guide* for your environment.)

Virtual printing serves two functions:

(1)   Preserving Formatting Commands

Some user utility and application programs, such as compilers and some word processors, strip the print formatting commands from text files when the files are stored. The virtual spooled printer stores the output in a printable format for delayed printing on the network printer.

(2)   Handling Printer-Directed Output

Some programs produce output that can only be directly processed by a printer (not stored). These programs will

send output to a virtualprinter as if it were a real, local
printer for delayed printing on a network printer.

A.5 Printing the Header and/or Trailer Page

A header and/or trailer page is normally printed for each job.
The format of these pages is taken from the header and trailer
volumes:

/MAIN/SYSTEM/PRINTERS/HEADER/<name>

and

/MAIN/SYSTEM/PRINTERS/TRAILER/<name>

where *name* represents the name of the header volume and
trailer volume, respectively.

If different printers are to print different headers and trailers, a
volume for each header and trailer must exist, and their path-
names must be specified in the configuration volume.

The print server will print a user logo on the header and trailer
pages if configured to do so. This logo consists of the 'USER'
value set in the user's defaults file, or the user's station number
(in hexadecimal). The formatting information that governs the
shape of this logo is placed in the header and trailer volume(s)
and is implemented by a CHARSET volume provided with the
print server. User logos and the CHARSET volume are dis-
cussed in Chapters 5 and 7.

A.6 Improving Performance of /MAIN/SYSTEM/QUEUE/NEW

/MAIN/SYSTEM/QUEUE/NEW is a directory volume, three sec-
tors long, which is created whenever the virtual printer closes a
print request. When the print server is looking for a request to
queue, it does a list of this volume. Because the volume is
extendible, it will grow in size as needed, but it will also become
fragmented all over the disk. To increase performance it is

suggested that this volume be deleted and recreated as a direc-
tory volume with a size of 64 sectors. This may be done with the
following commands:

DELETE //SYSTEM/QUEUE/NEW<Return>
CREATE //SYSTEM/QUEUE/NEW,T=Y,SZ=64.S,<Return>

The change should be made on all file servers that are using vir-
tual printing.

Appendix B

Print Server Diagnostic Error Messages

Watch the LEDs on the back of the PLAN 1000 during self test. If a LED comes on and stays on or an error message appears on the display, a component has failed.

Refer to Table B-1. In the table, LED patterns 9 through 11 are non-fatal errors. Should one of these errors occur when the host file server is running, the PLAN 1000 prompts you to press the ATTN key. The ATTN key disables the malfunctioning device, and other operations continue.

Error messages for LED patterns 9 through 11 also contain sub-error codes (represented in Table B-1 by "#N"). These codes report serial or parallel port failures and can help determine whether a component or specific connection is faulty (see Table B-2).

LED patterns 1 through 8, and 15 are fatal errors. These patterns come on and stay on.

LED pattern 12 indicates that you disabled the print server when you aborted startup by pressing the ATTN key at the end of self-test. You will be prompted to press the ATTN key to restart the print server.

Should one of these patterns come on and stay on, call your network service representative.

Table B-1

LED Patterns and Error Messages

Pattern	#1	#2	#3	#4	Error Message	Condition
0	OFF	OFF	OFF	OFF	None	No error
1	ON	OFF	OFF	OFF	None	Bad CPU
2	OFF	ON	OFF	OFF	None	ROM failed checksum
3	ON	ON	OFF	OFF	Expecting AAAA, but got BBBB at $XXXXXXXX	RAM failed pattern verification
4	OFF	OFF	ON	OFF	RAM parity error in bank # at $XXXXXXXX	Parity error reading from RAM
5	ON	OFF	ON	OFF	RAM not refreshing	RAM refresh not occuring
6	OFF	ON	ON	OFF	No NMI or wrong frequency	No NMI or wrong frequency
7	ON	ON	ON	OFF	Bad RIM	RIM failed power-on self-test
8	OFF	OFF	OFF	ON	Expecting AA, but got BB at RIM $XXXXXXXX	RIM RAM failed pattern verification

Pattern	#1	#2	#3	#4	Error Message	Condition
9	ON	OFF	OFF	ON	Serial #N, press ATTN key to disable	Serial port failed loopback test
					Serial disabled	
10	OFF	ON	OFF	ON	Parallel-1 #N, press ATTN key to disable	Parallel port 1 failed loop-back test
					Parallel-1 disabled	
11	OFF	ON	OFF	ON	Parallel-2 #N, press ATTN key to disable	Parallel port 2 failed loopback test
					Parallel-2 disabled	
12	OFF	OFF	ON	ON	Press ATTN key to abort startup	Startup disabled by operator
					Press ATTN key to restart	
15	ON	ON	ON	ON	None	Severe or unknown error

Table B-2

Sub-error Codes and Conditions

These codes appear on the display if an error occurs.

Serial Port Failures

Sub-error Codes	Condition
#1	Bad DTR to DSR through on board diagnostic loopback circuit
#2	Bad RTS to DCD through on board diagnostic loopback circuit
#3	Bad CTS or transmitter to receiver timeout through on board diagnostic loopback circuit
#4	Data error
#5	No interrupt from UART transmitter ready
#6	Bad DCD
#B	Transmitter to receiver timeout through external diagnostic connector
#C	Data error through external diagnostic connector

Parallel Port Failures

Sub-error codes	Condition
#1	Data pattern $55 not verified
#2	Data pattern $AA not verified
#3	Bad STR to POUT signal path
#4	Bad TAF to FALT signal path
#5	Bad INIT to BSY signal path
#6	Bad SEL (selected) status line
#7	Bad ACK (acknowledge) status line

Appendix C

Protocol

In the configuration volume, the following protocols can be specified for the serial printer:

DSR/DTR
ETX/ACK
XON/XOFF
ENQ/ACK

Table C-1

Protocol Values

Protocol desired	keyword required	char1	char2
hwprotocol	none or	na	na
xon/xoff	xon/xoff	$11	$13
enq/ack	enq/ack	$05	$06
etx/ack	etx/ack	$03	$06

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Cardchk Utility Program for the Apple //	LC40-0402
Cardchk Utility Program for the Apple ///	LC40-0403
Cardchk Utility Program and IBM NIC Theory of Operations Manual for the IBM PC	LC40-0404

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